

Amendments to the Claims:

Listing of Claims:

1. (currently amended) A method for heat treating at least one workpiece comprising the steps of:

cleaning a furnace to be used during said heat treating method;

    said cleaning ~~method~~ step comprising injecting a gas at a workpiece center location and applying heat; and

    diffusion heat treating said at least one workpiece in a gas atmosphere with said gas being injected at said workpiece center location.

2. (Original) A method according to claim 1, wherein said cleaning method comprises injecting said gas into said furnace at said workpiece center location at a flow rate sufficient to create a pressure differential which carries contaminants away from said workpiece center location toward an exit.

3. (Original) A method according to claim 2, wherein said gas injecting step comprises injecting said gas at a partial pressure of at least 0.8 Torr.

4. (Original) A method according to claim 2, wherein said gas injecting step comprises injecting said gas into said furnace at a rate of 30 liters per minute to 70 liters per minute.

5. (Original) A method according to claim 2, wherein said gas injecting step comprises injecting an inert gas.

6. (Original) A method according to claim 2, wherein said gas injecting step comprises injecting argon.

7. (Original) A method according to claim 2, wherein said gas injecting step comprises injecting a reducing gas.

8. (Original) A method according to claim 1, wherein said diffusion heat treatment step is carried out at a temperature in the range of 1900 degrees Fahrenheit to 2500 degrees Fahrenheit for a time period in the range of 1 to 24 hours.

9. (Original) A method according to claim 1, wherein said diffusion heat treatment step comprises injecting said gas into said workpiece center location at a rate sufficient to carry away contaminants in said workpiece but less than a rate at which a door to said furnace is caused to open.

10. (Original) A method according to claim 9, wherein said diffusion heat treatment step comprises injecting said gas into said workpiece center location at a partial pressure of at least 0.8 Torr.

11. (Original) A method according to claim 9, wherein said gas is injected into said furnace at a flow rate of 30 liters per minute to 70 liters per minute.

12. (Original) A method according to claim 9, wherein said diffusion heat treatment comprises injecting an inert gas.

13. (Original) A method according to claim 9, wherein said diffusion treatment comprises injecting argon.

14. (Original) A method according to claim 9, wherein said diffusion heat treatment comprises injecting a reducing gas.

15. (Original) A method for providing at least one workpiece having a coating comprising the steps of:

diffusion heat treating said at least one workpiece in gas atmosphere within a furnace with said gas being injected at a workpiece center location;

removing said workpiece from said furnace; and

subjecting said coated workpiece to a surface finishing operation.

16. (Original) A method according to claim 15, wherein said diffusion heat treatment step is carried out at a temperature in the range of 1900 degrees Fahrenheit to 2500 degrees Fahrenheit for a time period in the range of 1 to 24 hours.

17. (Original) A method according to claim 15, wherein said diffusion heat treatment step comprises injecting said gas into said workpiece center location at a rate sufficient to carry away contaminants in said workpiece but less than a rate at which a door to said furnace is caused to open.

18. (Original) A method according to claim 17, wherein said diffusion heat treatment step comprises injecting said gas into said workpiece center location at a partial pressure of at least 0.8 Torr.

19. (Original) A method according to claim 17, wherein said gas is injected into said furnace at a flow rate of 30 liter per minute to 70 liters per minute.

20. (Original) A method according to claim 15, wherein said surface finishing step comprising subjecting said coated workpiece to a peening operation.

21. (Original) A method according to claim 15, wherein said diffusion heat treating step comprises injecting an inert gas into said workpiece center location.

22. (Original) A method according to claim 15, wherein said diffusion heat treating step comprises injecting argon into said workpiece center location.

23. (Original) A method according to claim 15, wherein said diffusion heat treating step comprises injecting a reducing gas into said workpiece center location.

24. (Original) A system for heat treating a coated workpiece comprising:

a furnace having a chamber; and

means for injecting a gas into an interior of said furnace chamber at a workpiece center location.

25. (Original) A system according to claim 24, wherein said gas injecting means comprises means for injecting said gas at a flow rate sufficient to carry any contaminants from said workpiece center location toward an exit.

26. (Original) A system according to claim 24, wherein said injecting means comprises means for injecting at least one of an inert gas or a reducing gas.

27. (Original) A system according to claim 24, wherein said injecting means comprises means for injecting argon gas.

28. (new) A method according to claim 1, wherein said injecting step comprises providing a manifold within a chamber of said furnace for delivering gas to a center of the workpiece location area.

29. (new) A method according to claim 1, wherein said cleaning step comprises heating said furnace to a temperature which is 200 to 300 degrees Fahrenheit greater than a temperature at which said diffusion heat treating step is being performed.

30. (new) A system according to claim 24, wherein said injecting means comprises a manifold located within said furnace chamber for delivering said gas to said workpiece center location, and wherein said system further comprises a source of said gas located externally of said chamber and a feed line connecting said gas source to said manifold.

31. (new) A system according to claim 24, wherein said injecting means comprises means for injecting said gas at said workpiece

center location while said coated workpiece is being diffusion heat treated.

32. (new) A system according to claim 24, further comprising at least one vacuum pump and said injecting means comprising means for introducing said gas at a flow rate which creates movement of contaminants from said workpiece center location towards low pressure areas about the furnace chamber created by said at least one vacuum pump.

33. (new) A system according to claim 33, wherein said gas introducing means comprises means for introducing said gas at a partial pressure sufficient to create a pressure differential which carries said contaminants away from said workpiece center location.